UNIVERSAL DIMMER SWITCH KNOB WITH NON-CYLINDRICAL ENGAGEMENT SURFACE

BACKGROUND OF THE INVENTION

[0001] This application relates to a dimmer switch knob, wherein an intermediate member, or insert, is connected to be driven by an outer knob through a non-cylindrical engagement surface.

[0002] Dimmer switches are known to control a light level. As known, a dimmer switch typically includes a knob that may be turned to change a light level from a lower to a higher level. Typically, a dimmer switch includes a shaft that is turned by the knob, and which functions to change the light level.

[0003] It is often the case that one would like to have some particular appearance to light switches, etc. As an example, a homeowner may wish that a switch on a wood paneled wall have a wood grain appearance. There are dimmer switch knob designs that can be utilized to provide these varying appearances. One problem with providing a dimmer switch of a particular appearance, is that the connection to the shaft varies across the marketplace. As an example, there are three main shaft designs/sizes currently in the marketplace. Thus, to provide complete choice for, as an example, ten different appearances, there would need to be as many as thirty different knobs.

[0004] To reduce this inventory requirement, so-called universal dimmer switches are known wherein separate intermediate members are provided with the knob. A particular intermediate member is selected to correspond to the shaft design on the dimmer switch where the universal knob is to be utilized. The knob is then placed over this intermediate member.

[0005] One weakness of the existing design is that the intermediate member has had a cylindrical outer periphery that frictionally engages a cylindrical inner periphery of the knob. At times, and in particular at the extreme ends of travel, the knob has sometimes slipped relative to the intermediate member. This is undesirable.

SUMMARY OF THE INVENTION

[0006] In a disclosed embodiment of this invention, a dimmer switch knob has a non-cylindrical inner peripheral bore on a rear side. The knob preferably has a particular appearance to be selected as desired based upon an interior design of the building that is to receive the dimmer switch.

[0007] The non-cylindrical bore in the knob mates with a non-cylindrical shape from the intermediate member. In this manner, the knob is less likely to slip relative to the intermediate member. In a preferred embodiment, there are a plurality of lobes extending from one of the knobs or intermediate member, that fit into notches in the other. The lobes are preferably formed on the intermediate member with the notches on the knob.

[0008] In a preferred arrangement, a plurality of the intermediate members are sold as a kit with the knob. Thus, a user may select the appropriate intermediate member and insert it onto the shaft, and connect the knob to the intermediate member.

[0009] The intermediate member preferably has three lobes creating an A-shape with an apex lobe designed to be more rigid than either lobe on the legs. To this end, the apex may be somewhat thicker, or strengthened in some other fashion relative to the legs. Thus, the apex is less likely to slip, and would be better able to resist any forces tending to cause it to slip.

[0010] The legs, in a relaxed position, are preferably spaced from each other by an angle that is different than the angle separating the corresponding notches. Thus, when the lobes associated with the legs are received in their respective notches, there is a pre-tension in the legs tending to cause the legs to move away from each other, and resist slippage of their lobes in the notches.

[0011] These and other features of the present invention can be best understood from the following specification and drawings, the following of which is a brief description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Figure 1 is a front view of the universal dimmer switch knob.

[0013] Figure 2 is a rear view of the universal dimmer switch knob.

[0014] Figure 3 is an exploded view of a first kit incorporating the present invention.

[0015] Figure 4 is an exploded view of a second kit incorporating the present invention.

[0016] Figure 5 shows another embodiment intermediate member.

[0017] Figure 6 shows yet another embodiment intermediate member.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0018] A universal dimmer switch knob 20 is shown in Figure 1 having a design 22 on the front face 23. The design is shown only as an example. In fact, the design may be as simple as a particular color, texture, wood grain, etc.

[0019] Figure 2 shows the universal dimmer knob switch 20 from a rear side when assembled to a switch. As shown, knob 20 incorporates an outer ring 24 and front face 23. Ring 24 may be cast of a metal, molded from plastic, cut from wood, etc. A bore 26 has notches 28 and 29 extending inwardly from its inner periphery. Thus, bore 26 is non-cylindrical.

[0020] An intermediate member 30 connects the knob 20 to a central shaft 31. As known, shaft 31 is connected to a dimmer switch mechanism. Rotation of the knob 20 causes intermediate member 30 to in turn rotate shaft 31, and change the light level provided by the dimmer switch.

[0021] The intermediate member 30 also has a non-cylindrical shape, and one that is tailored to match the inner periphery of bore 26 and notches 28 and 29. The intermediate member 30 is generally A-shaped. A central apex lobe 32 extends into notch 28 while leg lobes 34 extend into notches 29. As can be appreciated, the apex lobe 32 is of a greater stiffness than the leg lobes 34.

[0022] A central web 36 is formed in the apex 32. A central portion 37 of the intermediate member 30 includes a toothed inner peripheral bore 39 that mates with teeth on the outer periphery of shaft 31. While many of the known dimmer switch styles have a toothed mating connection, other non-cylindrical shapes also exist to connect the internal shaft to the intermediate member. See, for example, the connection shown in element 40 in Figure 4 of this application.

[0023] Preferably, the notches 29 and notch 28 are spaced from each by an angle A. An angle B is defined between the leg lobes 34 and is preferably greater than angle A between the notches 29.

[0024] Angle B, as discussed within this application, is actually bigger than that illustrated in Figure 2. Angle B is the relaxed distance between the leg lobes 34. As discussed above, this relaxed position is typically greater than that illustrated in Figure 2, and greater than the angle A. When the leg lobes 34 are received within the notches 29, there is a pre-tension or bias force tending to force the leg lobes 34 away from each other back to a relaxed position. The intermediate member 30 is preferably molded from a suitable material that would provide this bias force, such as plastic. The bias force provides further resistance to slipping.

[0025] In a preferred embodiment, the angle B is greater than the angle A by 5° to 10°. In one actual example, the angle B was greater than the angle A by 7°, with angle A 120° and angle B 127°.

[0026] The dimmer switch knob 20 is preferably sold as a kit such as shown in Figure 3. Three intermediate members 30, 38 and 40 are provided with the kit. Intermediate members 30 and 38 have a very similar configuration, and correspond to particular manufacturers' shaft sizes/design. Intermediate member 40 is also similar to members 30 and 38, however, central opening 42 is somewhat distinct, again to correspond to a particular manufacturer's shaft shape. When a consumer assembles the knob 20, he initially selects the appropriate intermediate member 30, 38 or 40, and inserts this onto the shaft. Knob 20 is then placed over the selected intermediate member with the lobes received in the appropriate notches. As mentioned earlier, the knob 20 has a front face 23 with some particular appearance. In a cast or molded design, the ring 24 preferably is formed as shown in Figure 3, with the notches 28 and 29 generally formed to extend inwardly from the inner periphery of bore 26.

[0027] As shown in Figure 4, in other designs, the knob 44 may have bore 46 with notches 47 and 48 cut into the inner periphery. The general operation is similar to the Figures 1-3 design, however, this design is perhaps more easily implemented when the knob 44 is formed of wood, or a ceramic material.

[0028] As shown in Figure 5, another embodiment intermediate member 60 includes its leg lobes 62 having a split ends 64 with an intermediate channel 66. This arrangement allows for adjustment of the split ends 64 into contact with the notches to accommodate tolerances in the size of the notch. Generally, the distance between the split ends 64 in a relaxed position is greater than the same circumferential distance within the notch such that the split ends are biased towards each other when received in the notch to increase the frictional gripping force. This embodiment is particularly useful in the Figure 4 embodiment knob.

[0029] Figure 6 shows yet another intermediate member embodiment 70, having the leg lobes 72 with an outer ribbed surface 74. As shown, the outer ribbed surface 74 includes two side ribs 76 with a forward rib 78. Again, this embodiment provides for increased ability to deal with any tolerance issues in the formation of the size of the notches.

[0030] The present invention is better able to resist slippage by a combination of friction and spring tension to connect the intermediate member to the outer knob.

[0031] Although preferred embodiments of this invention have been disclosed, a worker of ordinary skill in this art would recognize that certain modifications would come within the scope of this invention. For that reason, the following claims should be studied to determine the true scope and content of this invention.